

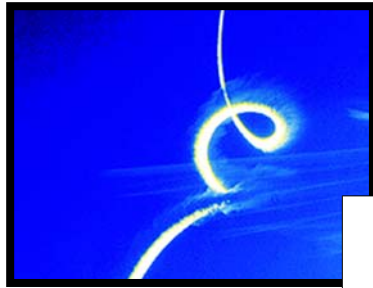
Introduction



*There ain't no rules around here. We're
trying to accomplish something!*

—Thomas Edison





The Missile Defense Agency (MDA) invests in innovative technologies to help defend the United States and its allies from increasingly sophisticated ballistic missile threats. From its inception, MDA and its predecessors, BMDO and SDIO, have supported the development of these technologies for integration into weapon systems as well as for spinoffs into commercial applications.

Introduction

Develop

Q: *Why is the Missile Defense Agency (MDA) funding the development of advanced technology?*

A: Antimissile defenses cannot be developed overnight. Yet the threat of ballistic missile attack continues to grow. Significant leaps in technology are needed to make the vision of superior missile defense a reality. These leaps offer the potential to push forward the boundaries of known science and engineering to allow scientists and engineers to create ever-more-sophisticated technology. With such technology, MDA can strengthen its ballistic missile defenses—by making them more accurate, robust, capable, and affordable. Reaping such benefits, however, is not without significant risk. Sometimes, a large investment must be made to make the very discovery that overcomes a key technology barrier.

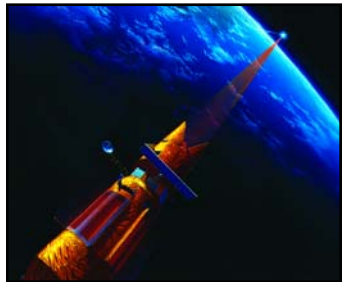
Q: *What kinds of technology are being developed?*

A: Advanced research and development (R&D) projects are concentrated in algorithms, electronics, materials, photonics, power, propulsion, sensors, and thermal management. For example, laser radars are needed to locate and track missiles throughout their trajectory, while algorithms are key to discriminating between real and decoy missiles. Nanopowders—materials with diameters significantly smaller than the width of a strand of hair—could make

infrared seeker windows harder and more transparent. Heat sinks could provide interceptors with much-needed thermal management, preventing sensitive electronics from overheating. Solar cells could provide satellite electronics with more power, extending a platform's surveillance duties in space.

Q: *Who develops this technology?*

A: MDA does not operate any development facilities or laboratories of its own, so it depends largely on the military branches and other Federal agencies for technology management. While large businesses perform the majority of technology development work, small businesses and universities are also important technology contributors. Through programs such as MDA's Small Business Innovation Research (SBIR), Small Business Technology Transfer (STTR), Innovative Science and Technology, and in-house advanced concepts and advanced systems, these organizations test the scientific and technical merit of advanced technology concepts.



Transfer

Q: *Why transfer this technology to commercial markets?*

A: MDA supports technology transfer for several reasons. Transferring MDA-funded technology to commercial markets can reduce its cost through quantity production. It can also prove a technology's reliability and improve its performance. Often, these benefits are realized without additional MDA funding because the technology developers leverage private R&D funds. However, in the final analysis, MDA funds technology to meet its mission of ballistic missile defense.

Technology transfer supports the mission when it keeps MDA-funded technologies alive for MDA acquisition decisions. For example, suppose a small technology company develops a tiny accelerometer to help guide a ballistic missile interceptor, but it will be years before this technology is inserted into a missile defense system. Without any sales, the company may go bankrupt. To survive, it finds an automobile manufacturer that needs a new triggering mechanism for its air bag deployment systems. By reducing the size and cost of the accelerometer while increasing its accuracy, the company sells the device in mass quantities to the automobile manufacturer. By creating a new revenue source, it can stay in business and be ready to supply the technology when MDA is ready to insert the technology into the interceptor.



Technology transfer responds to public law and Department of Defense (DOD) policy. More than 20 different Federal laws and directives promoting technology transfer have been enacted. Key laws include the Stevenson-Wydler Technology Innovation Act (1980), which required Federal laboratories to facilitate the transfer of federally owned and originated technology to state and local governments and the private sector. The Bayh-Dole Act (1980) enabled universities and other nonprofits to own and patent inventions resulting from federally funded research programs. Presidential Executive Order 12591 (1987) directed Federal agency heads to help transfer technology to the marketplace, and granted title to innovations growing out of federally funded research to the institutions that performed the research. DOD Directive 5535.5, "DoD Domestic Technology Transfer (T2) Program," re-established DOD's policy of support and participation in technology transfer.

And finally, technology transfer provides substantial economic and social benefits. To transfer a technology to the commercial sector, several things must happen. A new business must be formed to create a product from the technology, find customers, and generate sales. Employees must be hired to perform the administrative, engineering, and marketing functions. So technology transfer results in the creation of new businesses and jobs. When these businesses bring new technology to the marketplace, it also increases the economic competitiveness of the United States.

Q: *Who assists this technology transfer?*

A: The MDA Technology Applications program is responsible for the transfer of MDA-funded technology to the commercial sector. The National Technology Transfer Center-Washington Operations (NTTC-WO) supports the program through a cooperative agreement with MDA. Established in 1993, NTTC-WO has a proven track record of supporting the MDA Technology Applications program, and helping organizations to transfer their MDA-funded technologies to the commercial sector. Its unique approach to MDA technology transfer includes business assistance and outreach support services.

Assist

Q: *How does NTTC-WO assist all MDA technology developers?*

A: To help companies close to product release focus on applications issues needed for success, NTTC-WO offers the Technology Applications Review (TAR). The TAR can be compared to a board of directors meeting. Researchers



present summaries of their MDA-funded innovations to a panel of business experts, emphasizing their commercial applications. The presenters and the panel then discuss the commercial potential of the innovation as well as the performance and financial milestones. Presenters may benefit from the process by learning of potential new applications, markets, business opportunities, and customers. They also receive feedback on timeliness, valuation, market prospects, and likely competition. Another key benefit is that presenters are given contacts in manufacturing, sales, financing, and intellectual property.

Q: *How does NTTC-WO assist first-time SBIR award winners?*

A: To assist first-time SBIR award winners, NTTC-WO offers the Business Focus Workshop (BFW). The BFW is designed to help young companies detect and resolve technology development and business issues early. It involves a one-day intensive meeting in which a representative of a small technology company is teamed with an NTTC-WO commercialization engineer and a business consultant. The group works independently for four hours, covering a detailed topic list of business development issues such as market applications, sales projections, marketplace benefits, competition, intellectual property, and finance strategy. During the session, the company representative prepares a presentation that concisely summarizes the business case for the company's product. The day concludes with the representative presenting to a larger group of business and technology experts who provide targeted feedback and strategic advice.



Q: *How does NTTC-WO assist MDA with technology identification?*

A: NTTC-WO is managing a new technology transfer demonstration project called the Commercial Technology Exploitation (CTE) Initiative. CTE hopes to identify commercial, non-defense technologies that can enhance missile defense capabilities and forge relationships between MDA Program Elements and commercial industry. The challenge of the CTE program will be to fully understand and prioritize key capability enhancements suitable for such a demonstration and translate them for non-defense industry experts to use effectively. If all goes well, successes could provide significant savings in research, development, and scale-up costs while providing a better-performing solution.

Promote

Q: What types of publications does NTTC-WO produce to help MDA-funded companies promote their businesses?

A: For the MDA Technology Applications program, NTTC-WO develops a wide variety of publications that feature MDA-funded technologies and their developers. Perhaps the most visible publication is the quarterly *MDA Update*

newsletter, which features 10 to 12 new MDA-funded technologies with promising commercial applications. Distributed to more than 7,000 people involved in technology transfer and commercialization, the newsletter helps featured companies gain additional networking contacts and opportunities for successful business ventures. Technology developers also receive reprints of their newsletter article to distribute at business meetings and conventions.

Special reports are developed to highlight MDA-funded technologies that can be grouped together by application area. The *Technology Applications Report*, produced yearly, features MDA's top success stories in the areas of communications, computing, electronics, imaging, materials, and sensors. To help in the war on terrorism, *Missile Defense Technologies: Tools to*

Counter Terrorism was developed to highlight MDA-funded technologies that law enforcement organizations and security companies can use to prevent further attacks. Other singularly focused reports have been published on technologies for aviation safety, biomedicine, electric utilities, fiber optics, and the environment.

Q: How is information about MDA technology transfer made available via the Internet?

A: Through a successful demonstration project, NTTC-WO developed mdatechnology.net, an Internet portal that provides information about MDA technology transfer. The site features background articles on MDA-funded

technologies, which can be easily and quickly searched. It also provides links to press releases from companies that are commercializing MDA-funded technologies. Digital versions of all MDA technology transfer publications also are available. In addition to mdatechnology.net, NTTC-WO maintains the technology transfer section of MDALINK, MDA's official presence on the Internet.

Q: How else are MDA-funded technologies promoted?

A: NTTC-WO staff often exhibit at technical conferences and meetings to disseminate information about MDA technology transfer opportunities. Recently attended events include the Materials Research Society meeting, Photonics East/West, and the Space and Missile Defense Conference.

